Critical Failure Factors For ERP Implementation

A Case Study of Tehran Regional Electric Company, a governmental organization in Iran

By

PARISA MINOOCHER

NITIABALAN KARUPPAYAH

PRABAKHER SUBRAMANIAM

Universiti Sains Malaysia

2013

NO. REKOD: PPSP-B-ADK-14

GRADUATE SCHOOL OF BUSINESS (GSB)

UNIVERSITI SAINS MALAYSIA

DECLARATION

We hereby declare that the project is based on our original work except for the quotations and citation which have been duly acknowledged. We also declare that it has not been previously or concurrently submitted for any other degree at USM or any other institutions.

_____

(Signature)

Name : Parisa Minoocher

Date : 31 May 2014

_____

(Signature)

Name : Nitiabalan Karuppayah

Date :31 May 2014

_____

(Signature)

Name : Prabakher Subramaniam

Date : 31 May 2014

NO. PINDAAN: 00

Acknowledgements

First and foremost, we would like to thank Dr. Noor Nasir Kader Ali for his SVP concept introduction in our research which proved critical in deriving most of the solutions and recommendations placed forward in this thesis. We also would like to thank the panel of examiners who reviewed our draft and provided valuable suggestions on improving the thesis.

Secondly, we would like to extend our appreciation to the entire Tehran Regional Electric Company (TREC), specifically Mrs Azarm Dehestani (IT Department Manager and ERP Team Manager), Mr Edalapour (ERP Planning Project Manager) and Mr Safariyan (ERP Project Excutive Manager) who helped to provide invaluable information on organization structure and taking time to answer our extensive interview questions. Details shared during the interviews and emails proved to be extremely important in analyzing problems discovered during the thesis project.

We would also like to commend our fellow USM SSME course-mates whom directly and indirectly shared valuable knowledge during update presentations and kept us going in the rough times we experienced during the course of preparing this thesis by constantly encouraging among ourselves.

Finally, we would like to sincerely thank our family members who stood by us at all times and withstood constant complaints during the entire process. This thesis would not have been possible without their contributions as well.

Table of Contents

List of Table

List of Figures

List of Abreviations

BI	Business Intelligence
BPR	Business Process Reengineering
CFFs	Critical Failure Factors
CSFs	Critical Success Factors
ERP	Enterprise Resource Planning
IS	Information System
IT	Information Technology
M	Million
ROI	Return on Investment
TREC	Tehran Regional Electric Company
SME	Small and Medium Enterprises
UML	Unified Modeling Language

Abstrak

Banyak syarikat di negara-negara membangun telah melaksanakan Perancangan Sumber Perusahaan (ERP) untuk kebaikan masing-masing, tetapi masih terdapat kekurangan dalam memeriksa Faktor Kegagalan kritikal (CFFs) terhadap kegagalan pengaruh pelaksanaan ERP dalam sesebuah organisasi. Kebanyakan kajian terdahulu dan kajian projek telah cuba mengenalpasti Faktor-faktor Kritikal Kejayaan (CSFs) ERP dan bukannya Faktor Kegagalan Kritikal (CFFs). Perlu diingatkan bahawa Iran adalah salah satu daripada negara-negara membangun yang mempunyai beberapa projek-projek pelaksanaan ERP yang menemui kegagalan.

Kajian kes dilakukan adalah berdasarkan kepada kegagalan pelaksanaan ERP di Tehran Regional Electric Company (TREC), syarikat terbesar kuasa serantau di Iran. Untuk menganalisis isu-isu yang dihadapi oleh organisasi ini, temu bual dijalankan dengan sumber-sumber dalaman di dalam organisasi untuk mendapatkan lagi data utama mengenai subjek penyelidikan. Maklumat yang diperolehi kemudiannya dibandingkan dengan kesusasteraan yang menerokai isu-isu yang sama dalam konteks sebuah organisasi kerajaan Iran, dan penyelesaian yang dicadangkan untuk mengatasi faktor-faktor yang membawa kepada isu-isu pada masa hadapan.

Tesis ini telah dikategorikan penyelesaian yang disyorkan untuk TREC dalam lima kategori: Pengurusan, Sumber Manusia, Teknikal, Latihan dan Komunikasi,

Vendor dan Perunding. Penyelesaian-penyelesaian yang dicadangkan telah dibincangkan secara meluas dalam karya ini dan membuka jalan untuk membantu TREC disediakan dalam pelaksanaan ERP masa hadapan.

Akhir sekali, kajian ini telah menyediakan rujukan yang sangat bermanfaat kepada TREC untuk mengenalpasti masalah yang berkaitan yang disebabkan oleh faktor-faktor ERP kegagalan kritikal dan berfungsi sebagai garis panduan yang berharga untuk TREC yang merancang untuk melaksanakan modul lain sistem ERP dalam organisasi mereka. Penyelesaian yang ditawarkan juga akan berharga kepada organisasi-organisasi kerajaan Iran yang bercadang untuk melaksanakan projek-projek ERP dalam jabatan mereka.

Abstract

Many companies in developing countries have implemented Enterprise Resource Planning (ERP), to achieve its benefits, but still there is a lack in examining Critical Failure Factors (CFFs) that influence failure of ERP implementation in an organization. Most of previous researches and studies projects have been tried in identifying ERP Critical Success Factors (CSFs) rather than Critical Failure Factors (CFFs). It should be noted that Iran is one of the developing countries that had several of its ERP implementation projects headed to failure.

The case study undertaken is based on ERP implementation failure in Tehran Regional Electric Company (TREC), the largest power regional company in Iran. To analyze the issues faced by this organization, interviews were conducted with internal sources within the organization to further obtain primary data on the research subject. The information obtained are then compared against existing literatures explored on similar issues in the context of an Iranian governmental organization, and solutions are proposed to overcome factors leading to the issues in the future.

This thesis has categorized the solutions recommended to TREC in five main categories: Managerial, Human Resources, Technical, Training and Communications, Vendor and Consultants. These proposed solutions have been discussed extensively in this thesis and paving path to help TREC be prepared in future ERP implementations.

Finally, this study has provided a very beneficial reference as a result for TREC to identify the relevant problems which is caused by ERP critical failure factors and serves as valuable guidelines to TREC that is planning to implement other modules of ERP system in their organization. The solutions offered will also be valuable to other Iranian governmental organizations who intend to implement ERP projects in their departments.

Executive Summary

This thesis provides an analysis on ERP implementation failure of Tehran Regional Electric Company in Iran. Past ERP projects in TREC had resulted in delay of implementation based on the originally projected schedule.

The thesis finds that ERP implementation in this organization is risky and highly probable to fail. The major CFFs that have been identified as critical for TREC require in-depth focus by the management of TREC. Results of analysis show that TREC organization is not aware of Critical Failure Factors (CFFs) that is costantly present and posing a threat to ERP implementation process.

Along the path of seeking for solutions, a wide literature review is conducted to explore the identified Critical Failure Factors. The primary data are collected from three interviewees' perspectives as well as projects' documentations from the organization. The findings are resulting from the analysis between available CFFs model and the primary experiential data obtained from the interviewees.

The recommended solutions discussed by the researchers are:

- Managerial Solutions
- Human Resources Solutions
- Training and Communications Solutions
- Vendor and Consultants Solutions
- Technical Solutions

The analysis is constrained to a governmental organization in Iran, and does not represent ERP implementation scenario in private-sector organizations which may not be facing a similar issue observed in TREC. Organization structural issues are not extensively explored in this study as it may have political repercussions within the organization.

Chapter 1: Introduction

1.1. Background

In recent years, Enterprise Resource Planning (ERP) systems have been used broadly by large, medium, and more recently even small companies. What is more, ERP systems are now deployed in many different countries around the world. ERP systems are developed in Germany and in the USA because of the features of these systems and what they can offer for organizations to improve their business practices. Enterprise Resource Planning systems comprise a number of business applications, such as general ledgers, payroll, supply chain management, manufacturing, and business intelligence (Wright and Wright, 2002). With the implementation of an ERP system, an organization can obtain numerous benefits. These systems help a company to integrate all data, not only across the departments, but also across the whole company.

Moreover, ERP systems give companies the ability to access a wide range of data in real time via the use of a single database, as well as generating the information on time and accurately. Despite the significant benefits that these systems can provide, ERP systems have been problematic for many organizations, especially in terms of their integration and complexity. Wright and Wright (2002, p99) state that the "implementation of an ERP system is not an easy task". It is quite a complex, costly and risky proposition; poor implementation and operation of ERP systems can have significant impacts on a business. The literature review shows that some companies have succeeded and achieved significant efficiency through ERP systems, while other

organizations have failed and witnessed declining performance as a result of the implementation of these systems (Davenport, 1998; O'Leary, 2000). It has been estimated from the literature review that at least 90% of ERP implementations end up late or over-budget and about half fail to realize the required results (Umble et al., 2003; Al-Mashari et al., 2003b; Holland and Light, 1999). So, the question that needs to be answered is why do so many ERP systems fail? Explanations for this high rate of failure have been given by a number of different sources.

Many organizations have failed when implementing ERP systems because they are not prepared for integration and simply buy a piece of off-the-shelf ERP software (Fahy, 2001). Verville and Bernadas (2005) indicated that the reasons for the failure of ERP systems are not only related to technical issues; more probably is related to either organizational changes, behavioral, social, and political reasons. Abdinnour-Helm et al. (2003) and Lengnick-Hall et al. (2004) pointed out that the failure was due to people problems rather than technical difficulties. Keil et al. (1998) on the other hand, believes that managers do not understand risks and critical failure factors related to these projects. Due to the high rate of failure and the complexity and risk of ERP implementation in Iranian organizations, together with the huge amounts of investments, in terms of both time and money, required for these systems, it is necessary to identify the critical failure factors that increase the probability of failure and decrease the likelihood of success in the implementation of these systems.

1.2. Problem Statement

Information Technology project failures have been widely documented in the press. Since 1995, The Standish Group has been conducting research studies on IT application development projects, titled "CHAOS". Project success was defined as "completed on-time and on-budget, with all features and functions as initially specified".

The 1995 study of 8,380 projects showed that 83.7% of them failed one way or the other. In 1998, the study expanded to 23,000 projects, the failure rate was 74% (The Standish Group Inc., 1995; Kenagy, 2000). In fact, problems with initial implementation of ERP have been widely reported (Buckhout, Frey and Nemec, 1999). Since the goal of installing an ERP system is to transform and integrate a company's overall business processes, complete successes are difficult to achieve, while failures are extremely costly (Macvittie, 2001).

According to Gray and Larson, "Quality and ultimate success of a project are traditionally defined as meeting and/or exceeding the expectations of the customer and/or upper management in terms of cost (budget), **time (schedule)**, and performance (scope) of the project "(Gray and Larson, 2000, p. 63). ERP implementation failures often demonstrate the inability to meet these expectations.

In this case study, the Tier 1 symptom is delayed implementation of ERP system in the organization based on the **timeline projected** versus actual implementation in

TREC's first 2 ERP modules. For this research, the Symptom Versus Problem (SVP) Framework provided a better results for solving the problems. In this case study Tire1 symptom is: ERP implementation in TREC is delayed. Data supporting this main symptom is from interviewees. Extensive literature review is conducted to identify other related symptoms or problems that occur, which will be the Tier 4, Tier 5 .

1.3. Research Question

There is no formal framework or outline to prevent the problems occurring in organizations and also to provide requirements before ERP implementation, although quite a number of Critical Failure Factors (CFF) have been referenced in numerous literatures. Therefore, it is determined that there is a need for this research to examine and identify CFFs in a real case study (Tehran Regional Electric Company) and help organization in Iran to reduce or obviate the effect of failure by the identifying their strength and weaknesses. The main research question in this study is "*What are the **critical failure factors** for the **ERP implementation at a Tehran Regional Electric Company (TREC)?***" Additionally, this study also intends to provide recommendations to TREC higher management on how ERP implementation can be performed successfully based on the issues that had been disclosed to the researchers.

1.4 Research Objective

The main objective of this research is to **examine the CFFs in the ERP implementation in a case study** (TREC) and help to **provide solutions** to the issues faced by the subject organization.

1.5 Research Methodology

The research methodology for this project paper starts with interview method and qualitative analysis the secondary data (TREC ERP project documents) for finding the problem statement (Tier1, 2,3) Symptom and then continue with literature review to have a clear understanding of the symptoms, mainly from Tier 4 Symptom until Tier 6 Symptom. Secondary data analysis was used during the industry analysis, mainly from the related websites. Interview method was used from Tier 1, 3, Symptom and also in the relationship between Tier 6 until the problem (Tier 7).

In this research, an interview was designed, composed of both open and close questions. The interview questions are divided in two parts: the first part was meant to gather data about the interviewed person (such as his/her role in the project, his/her role in the organization, etc.) And the second part consisted of a series of questions about Critical Failure Factors, which aims to collect all useful information to clearly comprehend how the ERP project was executed in the organization. For each of the CFFs factors, existing literatures were reviewed where measures and indicators were identified, which could facilitate to evaluate if and how the analyzed CFFs had occurred in the ERP implementation process.

Moreover, in the data collection phase, multiple subjects were involved in which three managers from TREC were interviewed and different data sources were used in order to collect the independent perspectives. This includes online interview (Skype) and project documentations.

1.6 Interview Method

Researchers must collect and store multiple sources of evidence, comprehensively and systematically, in formats that can be referenced and sorted, so that convergence lines of inquiry and patterns can be uncovered as mentioned by Soy (1997). Audio recorded interviews, in Persian language, were conducted by one of the researchers and then later transcribed to ensure accuracy and completeness in capturing responses. The interview questions were designed based on the identified Critical Failure Factors in literatures that had been explored by other researchers.

The interviews were carried out with three different persons in order to obtain feedback from managers who were really involved in the ERP implementation organizational issues so that they could provide first-hand answers to the interview questions.

Table 1.1: Interviewees, roles and responsibilities.

Interviewee	Position in TREC	Position in ERP	Employment at TREC
Mrs Azarm Dehestani	IT department manager	Team manager	19 years
Mr Amin Edalatpour	Planning Project Manager	Strategic Planning	13 years
Mr Hamid Safariyan	Project Executive Manager	Budgeting & Training	5 years

1.7 Research Outline

This paper comprises of 6 chapters; Chapter 1 gives an introduction of the organization that had been chosen to perform a case study and issues identified in the organization is laid out. Chapter 2 discusses extensive literature reviews of other researchers on subjectd related to the issues identified in Chapter 1. Chapter 3 provides a brief overview of ERP industry analysis in Iran and the complications associated to this industry. Chapter 4 discusses on Tehran Regional Electric Company (TREC) as a governmental organization and its structure relative to the industry, as well as discussion on issues faced in implementing ERP systems. The case is further analyzed in Chapter 5 by the researchers and contains qualitative analysis of the researchers based on the issues that had been identified in the previous chapter, while the final chapter (Chapter 6) summarizes the findings of the undertaken study where the researchers' recommendations for solutions to the issues identified for the case study organization is discussed and concluded.

Chapter 2: Literature Review

The ERP system is a business management software that helps a company to automate and integrate its processes of business, and collect and share corporate data and all facts through the entire enterprise (Seddon, Shanks & Willcocks, 2003)

2.1 Benefits of ERP

The ERP systems are empowered to assist the information flow throughout the forentire enterprise for better efficiently and effectively. Seddon divided the useful benefits into five features (Seddon, et al, 2003): operational, managerial, strategic, IT infrastructure, and organizational. Figure 2.1 shows the benefits of ERP systems from these 5 different directions, and better understand why they are beneficial to the organizations.

2.2 The ERP implementation process

In order to better understand the process of ERP adoptions, a number of researchers have developed conceptual ERP life cycle frameworks or process models. Ehie and Madsen (2005) suggested a five-stage ERP implementation process using various reviews of the previous literature: project preparation, business blueprint, realization, final preparation, "Go-Live" and support (See Figure 2.2). Project preparation refers to a comprehensive planning phase that forms a project team with leadership roles, sets budget targets, and defines the project objectives and plan. In the business blueprint phase, the current business process is analyzed in detail in order to

select an appropriate ERP system. A project team is then trained on functionality and configuration of the selected ERP system. An understanding of the selected ERP system allows a project team to gain insight to reengineering its business processes.

In the realization phase, a project team focuses on implementing an ERP system, including modification, development of interfaces, and data conversion. At the same time, each process design is tested in a simulated environment. In the final preparation phase, the entire process is fully integrated and tested throughout the organization with full data and various scenarios. End users are trained in this phase as well. Finally, in the "go-live" and support phase, the ERP system is stabilized and may have extensions added to the system for competitive advantage.

Operational benefits:
By automating business processes and enabling process changes, they can offer benefits in terms of cost reduction, cycle term reduction, productivity improvement, quality improvement, and improved customer service.
Managerial benefits:
With centralized database and built-in data analysis capabilities, they can help an organization achieve better resource management, improved decision making and planning, and performance improvement.
Strategic benefits:
With large-scale business involvement and internal/external integration capabilities, they can assist in business growth, alliance, innovation, cost, differentiation, and external linkages.
IT infrastructure benefits:
With integrated and standard application architecture, they support business flexibility, reduced IT cost and marginal cost of business units' IT, and increased capability for quick implementation of new applications.
Organizational benefits:
They affect the growth of organizational capabilities by supporting organization structure change, facilitating employee learning, empowering workers, and building common visions.

Figure 2.1. Benefits of ERP

Proposed enterprise system benefits framework (Seddon et al., 2003, p. 79)

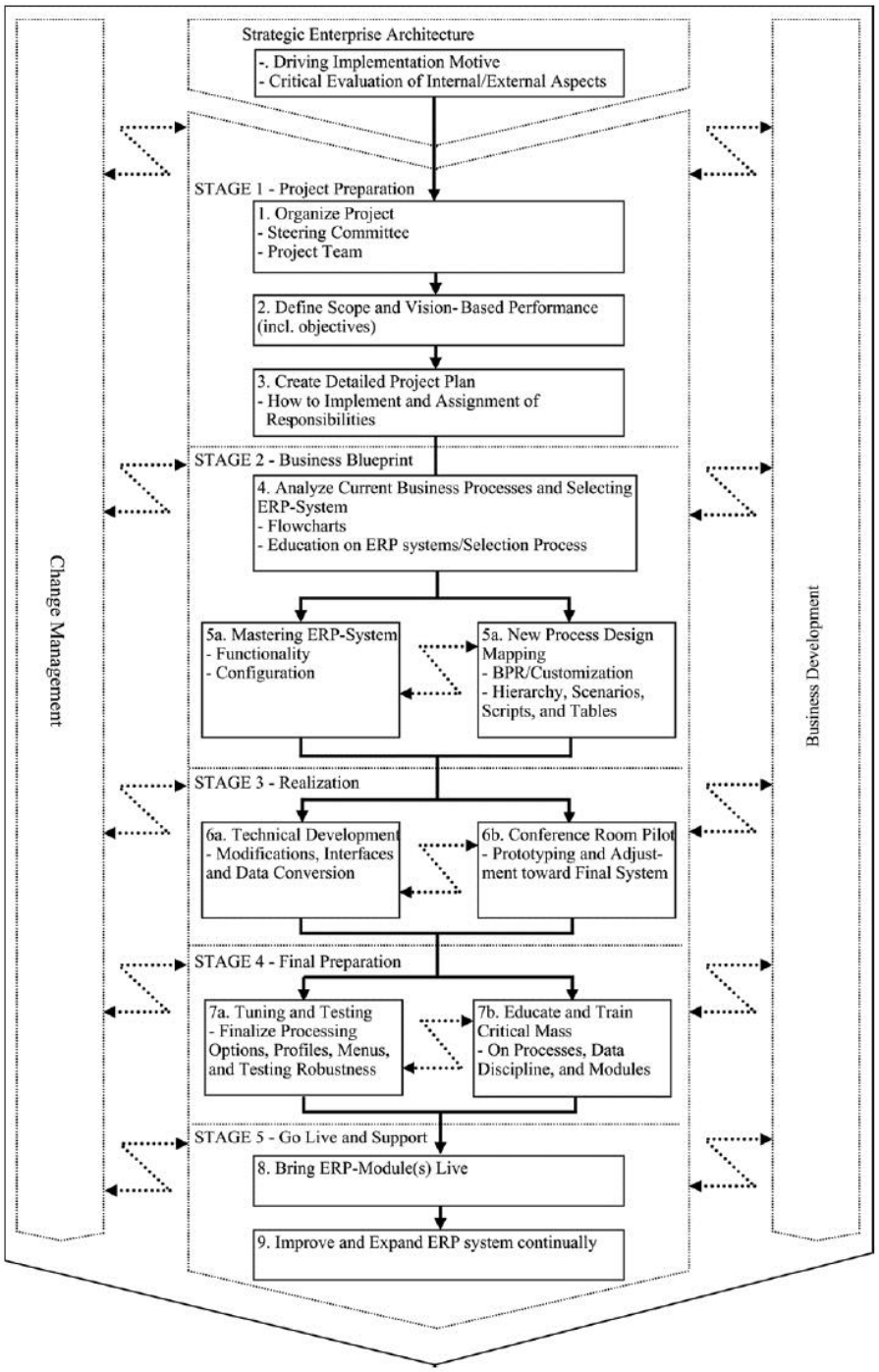

Figure 2.2 Five-stage ERP implementation process

(Ehie & Madsen, 2005)

2.3 ERP literature review

The difficulties of ERP implementations have been widely cited in literature (Appleton, 1997; Davenport, 1998). Many papers were written over the past 20 years on peculiarity of ERP selection, implementation, risk assessment and more general on ERP project in organization. Problems and potential approaches to ERP implementation have been discussed from several and complementary perspectives, several reviews were written about the ERP critical success factors, but none was made integrating the CSF view with a risk management approach. Al-Mashari (2003) illustrated a possible taxonomy of ERP research that is believed to cover the major issues in the fields (Figure 3). They argue that much research is still needed to better understand the ERP phenomena from a balanced perspective. Our aim is adding valuable information, especially from a critical failure factors perspective and demonstrating this assumption in the following review.

Figure 2.3.: ERP research taxonomy

Al-Mashari, (2003)

An analysis by Dezdar and Ainin (2010) about the Iranian ERP market showed that there are two types of ERP vendors in Iran. First, the international ERP vendors who act as agents. They are Epicore Software Corporation, IFS Applications, Logo Business Solutions, Mincom, Netsis Software,Oracle, SAGE, SAP, and 3i Infotech. Second, local Iranian IS companies; these companies developed their own ERP software.

2.4 Review on critical failure factors in ERP implementation

CFFs are the key aspects where "things must go wrong" in order for the ERP implementation process to achieve a high level of failure. Failure has been defined as an implementation that does not achieve a sufficient return on investment (ROI) identified in the project approval definition. It has been found that failure rates are in the range of 60-90 percent. Failures can be defined in other forms like exceeding budget, lagging behind projected schedule, and failure to match expectations. As ERP implementation is a very complex process and tremendous difficulty is faced in practical implementation and transfer of embedded tactic knowledge (Lambe & Tan, 2003), this makes ERP more prone to failure. Implementing ERP systems is investigated by many researchers and number of failure factors have been identified by researchers in developed and developing countries (Al-Mashari et al., 2003; Akkermans & van Helden, 2002; Wong et al., 2005).

Many large organizations still face by problems in their implementing ERP because of the limited resources, inexpert and inexperienced staff. ERP implementation

usually overrun the time schadule for a specific project (Nelson, 2007; Nah & Lau,2001). In the Many researchers have done significant studies on identifying critical factors in ERP implementation. The success factors categorized into two broad groups of strategic and tactical factors, by Holland and Light (1999). Somers and Nelson (2001) proposed a comprehensive list of 22 critical success factors associated with ERP implementation. Umble et al. (2003) extended the research on CSF and came out with nine CSFs for ERP implementation. Shahin and Sulaiman (2009) had a comprehensive literature review of articles published during 1999-2008 and identified 17 CSFs. Considering a large failure rate in ERP implementations, some researchers such as Momoh et al (2010) attempted to find out the critical failure factors (CFFs) in ERP implementation and based on a comprehensive literature review proposed 9 CFFs.

Ganesh L and Arpita Mehta (2010) also agree that there is a significantly low studies related to CFF in terms of Indian ERP implementation failure, thus suggesting 20 CFFs based on a statistical approach. (Ganesh, L., & Mehta, A. (2010).

According to the Malahat Pouransafar et all (2013) , the most challenging items that are considered to be major failure contributors to ERP implementation in Iran are lack of sufficient training, lack of management support , lack of financial support and resistance of staff to change.

Amin Amid et al (2012) on the other hand researched CSFs and CFFs in the context of Iran, and were able to identify 35 CFFs which are categorized into 7

categories; Vendor and Consultant, Human Resources, Managerial, Project Management, Processes, Organizational and Technical. The literature strongly suggests that although there are many researchers focus on CSFs in ERP implementation, CFFs are also imperative to understand areas that should be focused when considering ERP implementation in an organization. This will help to avoid similar mistakes done by earlier attempts as well as documenting lessons learnt along the process. ERP implementation in a developing country like Iran will face different difficulties compared to ERP implementation in developed countries such as USA, Britain and Germany. This is due to the primary functional misalignments that exists between a developed country and a developing country. These 35 CFFs thus identified are used in this paper and are shown in Table 2.1.

Table 2.1. Critical failure factors in Iran

Component ID	Component name	Factor ID	Factor name
C1	Organizational	OR01	Governmental structure of the organization
		OR02	Internal conflicts among departments
		OR03	Lack of organization transforms to fit the ERP system
		OR04	Misfit between organization culture and ERP system
		OR05	Misfit between organization structure and ERP system
		OR06	Misfits between the IT and business strategies
		OR07	Not clearly defined strategic goals
		OR08	Unstable managerial positions
C2	Project Management	PM01	Conflicts between organization and consultants
		PM02	Conflicts between organization and vendors
		PM03	Lack of a full time and balanced project team
		PM04	Poor project management
		PM05	Poor risk management
		PM06	Project cost overruns
		PM07	Project delays
		PM08	Scope creep
C3	Human Resources	HR01	High employee's resistance to change
		HR02	Inadequate education and training
		HR03	Inadequate employee involvement
		HR04	Ineffective communication with users
		HR05	Lack of change management
		HR06	Lack of employees' morale and motivation
		HR07	Poor key users
		HR08	Unrealistic expectations
C4	Managerial	MG01	Absence of an ERP readiness assessment before project implementation
		MG02	Lack of a performance measurement system
		MG03	Low degrees of management tendency to long and midterm planning
		MG04	Poor top management support
C5	Vendor and Consultant	VC01	Poor consultants
		VC02	Poor vendors
C6	Processes	PR01	Lack of process oriented vision
		PR02	Poor business process reengineering
C7	Technical	TC01	High rate of system customization
		TC02	High system complexity
		TC03	Inaccurate data

A. Amid et al (2012)

2.5 Similar Researches

J. Motwani et al (2005) tries to understand the factors that lead to the success or failure of ERP projects. The results from their comparative case study of 4 firms that implemented an ERP system suggest that a cautious, evolutionary, bureaucratic implementation process backed by careful change management, network relationships, and cultural readiness have a positive impact on several ERP implementations.

Moohebat et al (2011) investigated in a Iranian pioneer company which for first time implemented and used ERP system. Their evaluation is based on (Critical Success Factor) CSFs which are cited as guide for a successful ERP implementation in others researches.

Chapter 3: Industry Analysis

3.1 Worldwide and Iranian ERP market

The ERP software market is one of the largest market that is growing very fast in the software industry. Over the 1990s, organizations worldwide spent around $300 billion on ERP implementation (James & Wolf, 2000). Based the reports the ERP software market reached $39.7 billion by 2011 (Dover, 2012).

ERP market globally is owned by four of the top ERP vendors. SAP, Oracle, Microsoft and Sage alone dominate 60% of the market value worldwide. Each of the ERP suppliers has their own strengths and weaknesses, and some intersecting features while competing with one another as well as new entrants in the market. In Iran however, the most successful ERP system implementation is Oracle E-business which implemented in the Isfahan Steel Company. Based this successful experience, large enterprises in Iran have been trying to incorporate ERP solutions into their business environment. A report that was published in 2008 explain that 42 ERP vendors were active in Iranian market as an ERP solution supplier and 43% of these companies were agents of international ERP vendors and the others were the local companies that offer their own package of ERP solutions.

In fact, there are no statistics on the extent of the ERP vendors and also no clear report about the amount of ERP projects which are done by international solution

vendors or their third party agents in Iran. A number of large organizations in oil, automotive, gas, mill and consumer products have implemented and utilized these ERP systems and the majority of international ERP market share portion in Iran is taken by AP, Oracle, IFS, Mincom, Scala and Sage. In contrast, there are also several local vendors that have established their own solutions in Iranian companies. However, there are serious repercussions on implementing ERP solutions of these local ERP software providers. First, these local ERP softwares were developed around local practices and suffer from lack of best practices offered by their more prominent counterparts. Insufficient of advance integration and information on business process re-engineering (BPR) are other problems which faced by local vendors. Most of these do not include important modules in ERP systems like Production Planning and Material Requirement Planning. In addition, they do not provide multicurrency and multilingual support which is critical to build international customer base and support. Also, due to poor internet infrastructure in Iran, most of the ERP systems are not able to implement web-based interfaces which helps to increase access and processing speed of transactions and reports. Majority of the existing ERP systems in Iran are found not able to cater for operations and production management processes in a manufacturing organization. In fact, most of the local Iranian ERP systems only cater for inter-organizational processes and not intra-organizational interactions between suppliers and customers.

Moreover more than 10 Iranian Information System (IS) companies claimed that their ERP systems is designed and operated in the local language i.e. Persian. But, companies should be aware when discussing about ERP system which developed by

Iranian IS companies, as it may not achieve the standards of an ERP system. In general, Iranian developed ERP systems are designed based on the organizations' status and not based on best practices in the industry or improved and upgraded processes.

Chapter 4: Case write up

4.1 Background of the company

With an estimated population of 76.4 million as of 2012, Iran's capital city, Tehran's electric power consumption is always on high demand. In 2009, the estimated power consumption was rated at 173.1 billion kW/h. The major supplier of electricity supply to the entire Tehran city is a Tehran Regional Electrical Company, hereafter referred to as TREC is a governmental organization, and poised to cater for this huge demand in energy for its valued customers. TREC was established in 1965 and is a government body under the Ministry of Energy. Seyed Zaman Hossein is the Chairman and Managing Director of TREC and is a visionary man who desires to continuously provide a safe supply of electricity to the population of Tehran. TREC is currently investing heavily in Enterprise Resources Planning (ERP) system to enable better and efficient operation in terms of operations control, human resources, data warehousing, human capital development and customer satisfaction.

Under the supervision of TREC's Power Generation and Transmission Deputy, eight power plants located in Damavand, Montazerqaem, Besat, Rey, Qom, Shahid Rajaee, Parand and Rodshor generate power for the consumption of Tehran. Additionally, four hydro-electric power plants of Kalan, Amir-Kabir, Latian, and Taleghan together with the Tarasht steam-power plant, act as backup plants and are utilized when needed.

TREC has a significant advantage of being a government body's monopolizing energy supply to the entire city of Tehran. Being the leader and with no competition in the vicinity to challenge its position, significant effort has to be placed in order to ensure the customers served are satisfied with the level of service rendered.

Organizations in the Middle East are rapidly expanding investment in Enterprise Resources Planning (ERP) for different reasons. Majority of the organizations incorporate ERP to ensure sustainable revenue stream by optimizing resources available to the organization while minimizing or eliminating waste on the limited resources available.

4.2 Organization Structure

The organizational culture of TREC can be characterized as a bureaucratic culture. According to Wallach (1983), being very organized, silo-based and systematic, and at the same time having a clear line of responsibility can describe bureaucratic cultures. Control and power within the organization are hierarchial on information and authority flows. TREC possesses a culture where most of the times, high procedural steps are incorporated in the decision making process. This can be compounded further by the bureaucratic culture which on the other hand can be cautious, stable and matured process. The ERP implementation was expected to change many areas in the organization but the ERP system’s full benefit may not be fully realized and reaped as some of the involved subunits lack of driving power from the top management.

4.3 TREC: ERP Implementation Project

The ERP project of TREC was kick-started in January 2014 and estimated time to completion is 18 months with an investment budget about $ 300,000 US dollars.

4.4 Motivations For ERP Implementation in TREC

There are numerous motivations that encouraged TREC to decide on implementing an ERP system. Firstly, the company needed to replace old legacy systems that were lagging rapidly and the management's objective was to enhance the efficiency of the transactions thus increasing data processing speed. Moreover, a better integration and safety of the database were sought, in addition to a reduction of the number of the systems employed and of the interfaces. The ERP implementation goal is, in fact, to reduce complexity and therefore to enhance system management and maintainability. A side objective was to have better management tools available, in order to enhance the decision-making process by obtaining more accurate information and gain fast access to them. Redundant processes and duplication of efforts were one of the areas that TREC was looking to improve as this will help in terms of cost reduction and control, as well as contribute to operations efficiency. (For more information See Appendix E. page 103)

4.5 Decision planning phase

TREC recognized that the existing systems were not able to cope with the continuously increasing power generation requirement. Mrs. Dehestani, IT manager of TREC, shared in the interview:

> *Implementing ERP would help to collect information from business activities, thus decision making and business strategy planning would be more efficient and at a faster pace. (Mrs.Dehestani, 2014)*

4.6 Acquisition ERP system Phase

First, the company formed an acquisition team. Mrs. Dehestani (IT manager) was elected to be in charge of the project effort. Other members were managers of different departments within the company: Finance, Accounting, Human Resource, Sales, and Research & Development. They were requested to evaluate, and select the ERP package that fits best with the organization's IT infrastructure and requirement. Quantitative and qualitative assessments were to be made from the selected ERP vendors based on experience in implementing ERP systems.

Shortlisted ERP implements were contacted and asked to prepare a demo for the team. The team also visited several other governmental organizations which had successful ERP system implementations – For example tey visited Khorasan Regional

Electric Power Distribution Company. As a result, the team selected Poshtiban Niroo, a local ERP vendor, who are well versed in ERP system implementations in other governmental organizations in Iran with good track quality.

4.7 Staffing project team

During the implementation period, TREC formed two primary teams. First, the steering committee was headed by IT manager and included managers of all departments in TREC. Second, project teams consisted of members from IT department and several of each business units' key employees from Finances and Budget, Human Resource, Project Management and Planning departments. They were further divided into 4 sub-teams for different tasks with a condition that each sub-team has cross-functional members.Project team members were expected to continue to perform their daily routine tasks, while focusing on the ERP project as well.

4.8 Implementation plan

The project was officially initiated on 15th of January 2014. A clear project plan is developed based on project goals, scope, timeline, budget and personnel. It was originally expected that the new ERP system would take 18 months to be completely deployed. Initial investment was nearly 300,000 US dollars. There were 8 modules to be implemented and Figure 4 summarizes the implementation plan for the ERP modules. TREC have worked on implementing two ERP modules in their organization, which are